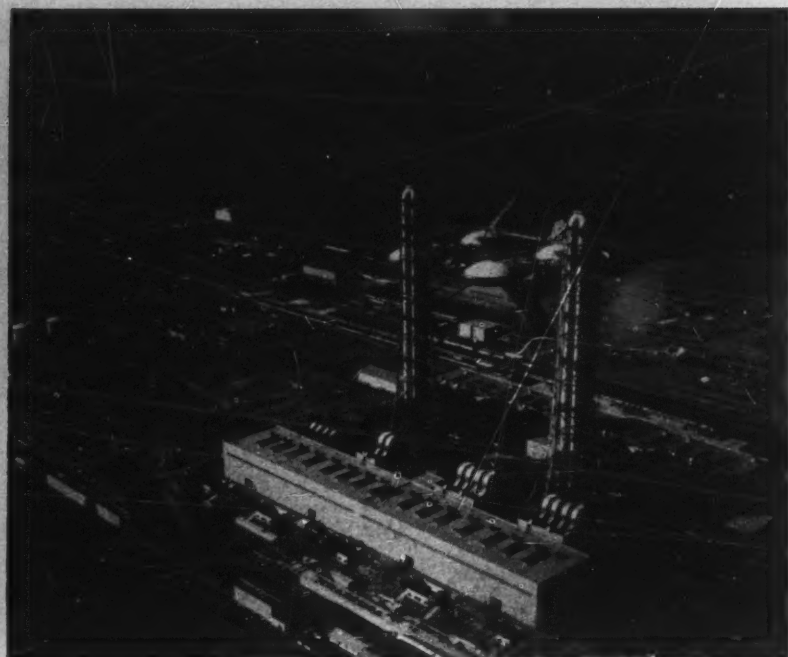


Electric Light & Power

THE NEWS MAGAZINE OF ELECTRIC UTILITY MANAGEMENT AND TECHNOLOGY

A PENNWELL PUBLICATION



Japanese start combined-cycle plant

Tokyo Electric Power Company's first combined-cycle power plant, Futtsu Thermal Power Station, has gone into service. The seven-unit 1000-MW plant already has recorded a thermal efficiency of 43.8 percent. The plant is located on reclaimed land in Tokyo Bay and burns liquefied natural gas. General Electric supplied the generating systems and associated equipment. An identical second 1000-MW combined-cycle station currently is under construction.

U.S. in danger of dependence on imported oil, says report

WASHINGTON—U.S. oil imports will continue to increase beyond 1995 making America and other nations highly dependent on potentially insecure oil supplies, according to a new study of the nation's energy security.

Released by Energy Secretary John S. Herrington in March, the energy security report to President Reagan warns that the outlook for the world energy situation in the future holds both opportunities and risks.

Although today's energy supplies are abundant, the report points out that trends are emerging that raise

serious concerns. Oil imports will rise from 5.2 million barrels per day in 1986 to between 8 and 10 million barrels a day in the 1990s. Currently, about two-thirds of the free world's reserves lie in Saudi Arabia, Kuwait, Iran, Iraq, and the United Arab Emirates. The report also pointed out that two-thirds of the 10 million barrels per day of unused oil production capacity is in the Persian Gulf region.

The energy report predicts that the region's share of the world oil market will rise from its current share of less than 25 percent to between 30 and 45 percent by 1995. OPEC countries are expected to account for between 45 and 60 percent of market share, near

the percentage shares held by OPEC in the 1970's, forecast the report.

"Although dependence on insecure oil supplies is thus projected to grow," stated the report, "energy security depends in part on the ability of importing nations to respond to oil supply disruptions; and this is improving."

Oil price decontrol and development of the strategic oil reserves have helped to make the U.S. more adaptable to changing situations, said the report.

Boost to world economy

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of oil and other resources continue to be used, this will help the world economy.

MD E0814 use lead times are so long for the discovery and development of oil reserves in frontier areas, and for the construction of new coal or nuclear plants, that projects not yet underway cannot be counted on before 1995.

While oil imports continue rising, the Energy Department says conventional production of natural gas in the U.S. will likely diminish beyond 1995.

"If coal or nuclear generation capacity proves less attractive in the future because of regulatory, financial, or any other sort of costs," predicted DOE, "the world is likely to consume more oil, face higher oil prices, and become more dependent

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Reagan announces \$2.5 billion commitment to fight acid rain

WASHINGTON—Secretary of Energy John S. Herrington announced March 23 that late in the year DOE will conduct an \$850 million solicitation for innovative clean coal technologies.

The announcement came on the heels of President Reagan's pledge several days earlier to seek \$2.5 billion over the next five years for demonstration of clean coal technologies.

Reagan said the new commitment would help ensure that the U.S. continues to work closely with the Canadians in addressing the effects of acid rain. The President explained that \$500 million will be requested for fiscal years 1988 and 1989 to fund new emissions control projects.

"I will also encourage industry to invest an equal or greater amount over this period, and to stimulate development and deployment of innovative technologies for reduction of air pollution emissions," said the President in a prepared statement.

Advisory panel will be formed

Reagan also directed Herrington to establish an advisory panel made up of state government participants and the government of Canada to advise on the funding and selection of new projects. The panel could total as many as 25 members, and will be chaired by Under Secretary of Energy Joseph F. Salgado.

Finally, Reagan asked Vice President George Bush to have the Presidential Task Force on Regulatory Relief to identify opportunities for addressing environmental concerns under existing laws. The White House explained that the task force will examine incentives and disincentives to the deployment of new emissions control technologies and other cost-effective, innovative emission reduction measures. Their findings will be reported in six months.

Reagan considers Canada pact

During an April 6 meeting with Canadian Prime Minister Brian Mulroney, Reagan "agreed to consider" a proposal to develop an accord between the U.S. and Canada on emission reductions.

In response to a question at Reagan's last news conference in March on whether he has considered setting acid rain reduction standards, the President said, "Yes, let me say that we've not just been sitting here holding back or anything... We have found out that the further we've gone, the more complex the issue of the source of acid rain becomes. So what we've been trying to do is avoid going down some avenue that would disappoint us and we wouldn't really solve the problem, but we would have wasted our resources."

Secretary Herrington stated that Reagan's proposal will strengthen the common bonds of cooperation with Canada, and place the U.S. in the forefront of a current worldwide to address the acid rain problem.

"We will fashion a program that, over the next five years, will entail multiple rounds of competition to elicit the best ideas from the creative minds of American industry," noted Herrington. "Each of the concepts to be demonstrated in this expanded clean coal program will be linked by a common characteristic—the capability to combine a high degree of environmental effectiveness with improved economic performance and plant reliability."

The current Clean Coal program involves almost \$400 million in federal funds. DOE said the first two project awards have been made, with seven more to follow.

Clean coal program

To implement the expanded program, Herrington said the U.S. will credit \$150 million in federal funding earmarked for the first round of clean coal projects. These funds represent the federal share of five of the nine first-round projects. In addition, another \$350 million will be requested in FY 1988. DOE also will ask Congress for an advance appropriation of \$500 million on FY 1989 funds.

This combined \$850 million will be combined into a single solicitation to be released, pending Congressional approval, between October and December of 1987. DOE explained that

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In the wake of Peach Bottom's closing

Sleeping on the job common to most industrial shift work

Robert A. Lincicome
Editor in Chief

BARRINGTON, IL—Shift operators that fall asleep while on the job may pose a threat to the safe operation of a nuclear power station, but they are by no means unusual, says a California specialist in sleep disorders and work/shift scheduling.

Richard M. Coleman, a Stanford, CA psychologist and member of the

clinical faculty at the Stanford University School of Medicine, spoke to *EL&P* after the Nuclear Regulatory Commission in late March ordered Philadelphia Electric to shut down its Peach Bottom nuclear plant because operators were observed sleeping on the job.

Coleman says 56 percent of shiftworkers in a recent survey of seven industrial plants—including

Continued on page 16

Westinghouse to design reactor for protracted nuclear war

● According to a report March 30 in *The New York Times*, the U.S. Air Force is looking into the possibility of constructing several hundred small nuclear reactors to be used in a protracted nuclear war. The *Times* said the Department of Defense has asked for \$5.5 million for the project in the fiscal year beginning in October. Westinghouse Electric Corporation has been chosen to submit a design for a 10 MW reactor. Officials quoted in the story say the units would be used to supply emergency power for computers, communication lines, weapon launching sites, and support equipment. The *Times* stated that those involved believe it will cost \$20 billion and five years to complete the program.

Niagara Mohawk adopts stronger alcohol-drug abuse policies

● Niagara Mohawk Power Corp. has strengthened its alcohol and drug abuse policies, according to the utility. "While there is no evidence of any widespread situations of this nature at Niagara Mohawk, it is a national societal illness and we do have a responsibility as members of that society to help stem this growing problem," explained Perry B. Woods, Jr., company vice president for employee relations. The company said it is adopting an employee alert to spot alcohol and drug abuses, and will screen all employees at nuclear sites who are required to undergo annual physicals. Employees with nuclear responsibility will be taken off the job pending investigation of any illegal drug-related occurrences, noted Woods. In addition, the policy calls for mandatory drug or alcohol screening for any Niagara Mohawk employees involved in on-the-job accidents causing injury or damage where human error appears to be a factor.

NorLight fiber optic network is operational and carrying traffic

● NorLight President and CEO Jim Rice recently announced that the organization's fiber optic network is operational and carrying customer traffic. "We are particularly excited about the role fiber optics will play in the expanding use of digital video transmissions in our region and the country," stated Rice. NorLight, a partnership of subsidiaries of five electric utilities in Wisconsin and Minnesota, serves Chicago, Minneapolis, Milwaukee and other areas in Illinois and Wisconsin.

U.S. oil use increases sharply; nuclear power sets record

● Preliminary statistics prepared by the U.S. Department of Energy found that the nation's electric utilities increased their consumption of oil by more than 36 percent last year, the largest single-year percentage since the 1973 Arab oil embargo. "Here we go again," said Atomic Industrial Forum President Carl Walske, "Oil imports are rising, and it appears that America is in serious danger of forgetting the oil price shocks of the 1970s. OPEC has conceded that nuclear energy world-wide contributed sharply to their recent woes. It would be a pity if we allowed them to gain an advantage over us once again." AIF also reported that in 1986, U.S. nuclear power plants produced a record 414 billion kWh, an increase of 8 percent over 1985.

Vogtle 1 granted full power license by the NRC

● Unit 1 of Georgia Power Company's Vogtle electric generating plant has been issued a full power license by the Nuclear Regulatory Commission (NRC). Vogtle 1 was previously licensed to load fuel and conduct low power testing (see March *EL&P* p.2). The NRC said it approved the full-power license after successful completion of the low power testing.

HEI subsidiary acquires two windfarms from Control Data

● Hawaiian Electric Industries' subsidiary Hawaiian Electric Renewable Systems, Inc. has agreed to purchase two existing windfarms from Control Data Corporation. "We have always believed that Hawaii is the perfect location for this form of alternate energy and that it has a future here," stated HEI President C. Dudley Pratt, Jr. The windfarms, located at Kahua Ranch and Lalamilo on the island of Hawaii, have a total generating capacity of 5,700 kW. "With the new technology that is now available to us, we believe we can operate these windfarms in an economically viable manner. We also expect to have the wind rights to expand at Kahua Ranch if it becomes economically feasible" added Pratt.

FERC approves Western Systems Power Pool trial operation

● Operation of the Western Systems Power Pool (WSPP), an experimental system intended to reduce the power costs of 15 utilities, has been approved by the Federal Energy Regulatory Commission. Under a two-year plan, the marketplace—rather than regulatory bodies—will set prices for discretionary wholesale sales of electric energy and transmission between WSPP utilities in 10 western states. "We hope to begin operations as soon as possible because this power pool arrangement will help utilities and their customers save money on energy costs," said Louis Vicent, WSPP spokesman and Pacific Gas and Electric Co. attorney.

APPA recognizes NY Power Authority for safety record

● The New York Power Authority was recently honored by the American Public Power Association for having the 'best safety record among the largest public power systems during 1986'. "This award reflects our commitment to safety," stated Power Authority Chairman Richard M. Flynn, "We're very proud that the APPA has honored that record." The awards were given to public power systems in seven categories at APPA's E&O workshop in Nashville.

Atlantic Electric sends personalized letters to its customers

● Atlantic Electric said its residential and commercial customers will be receiving a personalized letter detailing how much energy they used in the past year, what it cost, and how their payments were applied to the company's expenses. Atlantic Electric said the purpose of the mailing, now in its fifth year, is to keep customers informed of their energy buying decisions. "We feel that the letter is a good vehicle for demonstrating the value of electricity," said Atlantic Electric Vice President Customer Service Meredith I. Harlacher, "It stresses the value of electricity and conservation by using each customer's own consumption figures. It's an annual report to each customer."

Harvard honors Ginn as "Business Statesman of the Year"

● Centerior Energy Corp. Chairman and CEO Robert M. Ginn was named "Business Statesman of the Year" at the Harvard Business School Club of Cleveland's 29th Annual Business Statesmanship Award Dinner. The award is given annually to a Cleveland area CEO who "combines excellence in management of his business with civic involvement." In 1986, Ginn engineered the merger of Cleveland Electric Illuminating Co. and The Toledo Edison Co. to form Centerior Energy Corporation.

Public power issued \$21.4B worth of revenue bonds in 1986

● According to data published in the American Public Power Association's *Public Power* magazine, local publicly owned electric utilities issued \$21.4 billion worth of electric revenue bonds last year, or 18.7 percent of all tax-exempt bonds sold in 1986. APPA said 22 public power joint action agencies accounted for 44.4 percent, or \$9.5 billion, of the bonds issued, and Intermountain Power Agency issued the largest amount of bonds with \$2.45 billion.

TMI-1 resumes electricity production after five-month outage

● Three Mile Island Unit 1 has resumed electricity production after completing a five-month refueling and maintenance outage which began November 1, according to GPU Nuclear Corporation. The company said the outage, which followed a successful 13-month operating period, included extensive modifications to the plant's fire protection system. GPU has scheduled the unit's next refueling outage for the summer of 1988.

PEPCo's Thompson chosen as one of top CEOs in nation

● Potomac Electric Power Co. Chairman of the Board and CEO W. Reid Thompson has been chosen as one of the nation's top 12 CEOs by *Financial World* magazine. The silver award winner was selected from among 2,400 executives of public companies with annual revenues exceeding \$100 million. Thompson was cited for having "one of the best records for earnings and dividend growth in the industry," while managing to keep PEPCo's rates to consumers low, according to the utility. This marks Thompson's second silver award, he received his first in 1982.

PG&E's Diablo-2 completes first year of commercial operation

● Pacific Gas and Electric Co. said Unit 2 of its Diablo Canyon nuclear plant completed its first year of commercial operation in March. "We are extremely proud of Unit 2's performance..." stated PG&E President George A. Manatis.

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Utility capacity expansion needed soon, says report

WASHINGTON—Odds are better than even that there will be power shortages before the end of the century unless the utility industry substantially expands its capacity, according to a new study of U.S. electricity supply and demand.

The study was done for the Utility Data Institute, a not-for-profit clearinghouse for electric and gas utility data, by Applied Economic Energy Research Company (AER) of New York.

Most likely scenario

"While peak load should not surpass installed capacity by the year 2000, it is expected to exceed available capacity by 1997," explained AER President Marie Corio emphasizing that there is usually a certain portion of installed capacity out of service. "The most likely scenario of demand growth and projected supply indicates a capacity shortfall of five percent by the year 2000. Nationwide the probability that utilities will be unable to meet peak load is 7 percent in 1992, rising to 25 percent in 1994 and 50 percent in 1977."

The study used data from UDI and from the North American Electric Reliability Council to forecast by region of the country peak load demand and installed capacity under a variety of assumptions. AER then evaluated the adequacy of electricity supply by calculating projected operating margins.

Regional shortages

On a regional basis, UDI said the southeastern and the south central regions of the U.S. face the severest

prospects of supply shortages. Based on current construction plans, both regions are likely to experience negative operating margins by 1993, six years from now. (See accompanying chart.)

Since new power plants require at least that length of time to plan and put into service, the report says these regions' options to avoid shortages are limited. Without additional capacity these regions are virtually certain to experience a supply shortfall by the year 2000, stated the report.

AER noted that the probability of shortages in the Midwest and Mid-Atlantic states by the end of the century is greater than 50 percent. While the risk of power shortages in New England, most of Texas and the West is less than 50 percent, but still significant.

Group forecasts

The research group forecasts average national electricity demand growth of nearly 2.4 percent annually throughout the rest of this century, with regional growth rates varying from 1.8 percent in the Mid-Atlantic states to 3.1 percent in Texas. AER's forecast of electricity consumption in the year 2000 is 3.6 trillion kilowatt-hours. The amount of capacity required to meet that load will be 664,000 MW, about 44 percent more capacity than was required in 1985.

Peak demand uncertain

According to the report, peak demand forecasts are subject to a large degree of uncertainty. There is a one-sixth probability that peak demand in the year 2000 will exceed

PROBABILITY THAT ELECTRIC UTILITIES WILL BE UNABLE TO MEET PEAK DEMAND BY THE END OF THIS CENTURY

Region	Probability that Operating Margin is Less than Zero in:		
	1990 (%) (1)	1995 (%) (2)	2000 (%) (3)
ECAR	—	22.6%	56.1%
ERCOT	4.5%	9.5%	48.5%
MAAC	1.4%	38.1%	62.6%
MAIN	16.4%	52.9%	77.6%
MAPP	2.3%	54.6%	80.1%
NPCC	0.1%	8.6%	43.5%
SERC	13.0%	72.5%	90.0%
SPP	8.2%	83.8%	92.6%
WSCC	—	7.3%	43.7%
U.S.	0.5%	33.7%	69.8%

Note: — designates less than 0.1%.

(Source: Utility Data Institute)

750,000 MW. Also, there is an equal probability that it could be as low as 577,000 MW.

Source of uncertainty

AER Vice President and co-author of the study Sandra Lazo said the major source of uncertainty about the electricity supply is the completion and operation of new generating capacity according to present schedules.

Depending on how closely current schedules are followed, she said installed capacity is expected to be in the range of 709,000 to 719,500 MW at the end of the century. However, be-

cause of unexpected outages or routine maintenance, about 14 percent of that capacity will not be available to serve the peak load.

The report concludes that given the imminence of inadequate operating margins, substantial shortages can be avoided only by planning now for increased capacity.

Copies available

Copies of the 480 pp. report entitled *The Adequacy of U.S. Electricity Supply Through the Year 2000*, are available from UDI for \$750. For more information call UDI at (202) 466-3660.

Three equipment ideas from

Today's "third force" in large transformers. What it means to you.

Until recently, buyers of large power transformers focused most of their attention on the "big two." But now, with ASEA Electric on the American scene, your options are a lot broader. And better, too, in some important ways. Because ASEA Electric brings you the combined benefits of increased short circuit strength, reduced LTC maintenance, and easier installation. With it all, you get the support of a nationwide field organization. Plus full 725 kV testing and repair facilities right here in North America. So look at all your options next time you're in the market for a large power transformer. Talk to all three.

